Patent Claims

1. A test apparatus for testing a semiconductor device (2) having contact pads (3) on its top (4) and contact pads (3) on its back (5), where the test apparatus (1) has a test printed circuit board (6) having contact pads (7) and with a test socket (8) mounted on it, and where the test socket (8) has a locating seat (9) for locating the top (4) of the semiconductor device (2), and where the region of the locating seat (9) contains internal through-contact elements (10) through the test socket (8) to the test printed circuit board (6) in order to make an electrical connection between the contact pads (3) of the top (4) of the semiconductor device (2) and the contact pads (7) of the test printed circuit board (6), and where the test apparatus (1) also has a stamp (11) for pressing the semiconductor device (2) onto the internal through-contact elements (10) of the test socket (8),
characterized in that
the test socket (8) has external through-contact elements (12) which are arranged outside of the locating seat (9) and which make an electrical connection between contact pads (7) on the test printed circuit board (6) and contact pads (3) on the back (5) of the semiconductor device (2) to be tested when the stamp (11) is pressed on.

2. The test apparatus as claimed in claim 1,
characterized in that
when the stamp (11) is pressed on, the contact pads (3) of the back (5) of the semiconductor device (2) are electrically connected to contact pads (7) on the test printed circuit board (6) via through-contact elements (13) of a holding part (14) and via rewiring lines (15)

of a wiring part (16), and also via the external through-contact elements (12) in the test socket (8).

3. The test apparatus as claimed in claim 2, characterized in that the stamp (11) has, in the direction (A) of the back (5) of the semiconductor device (2) to be tested, the wiring part (16) and the holding part (14) with through-contact elements (13) for making contact with the contact pads (3) on the back (5) of the semiconductor device (2).

4. The test apparatus as claimed in claim 2 or claim 3, characterized in that the wiring part (16) of the stamp (11) has rewiring lines (15) from the positions of the through-contact elements (13) of the holding part (14) to positions of the external through-contact elements (12) in the test socket (8).

5. The test apparatus as claimed in one of the preceding claims, characterized in that the through-contact elements (10, 12, 13) have through-contact pins (17) which have spring-guided test tips (18, 19) which project from a top and a bottom, opposite the top, of the respective device component of the test apparatus (1).

6. The test apparatus as claimed in one of the preceding claims, characterized in that the through-contact elements (10, 12, 13) have a tubular central piece (20) which has test tips (18, 19) at its ends (21, 22), with a spring element arranged in the central piece (20) elastically cushioning the test tips (18, 19).

7. The test apparatus as claimed in one of the preceding claims,
characterized in that
the stamp (11) is designed for simultaneously pressing
- the through-contact elements (13) onto the contact pads (3) of the back (5) of the semiconductor device (2), and
- the external through-contact elements (12) of the test socket (8) onto the test printed circuit board (6), and
- the internal through-contact elements (10) of the test socket (8) onto the test printed circuit board (6) and onto the contact pads (3) of the top (4) of the semiconductor device (2).

8. The test apparatus as claimed in one of the preceding claims,
characterized in that
the stamp (11) is fitted on a pivot arm which pivots the stamp (11) into a test position (23) in which the pivot arm having the stamp (11) is oriented such that the through-contact elements (10, 12, 13) are simultaneously pressed against the provided contact points of the test apparatus (1) and of the semiconductor device (2).

9. The test apparatus as claimed in one of claims 2 to 8,
characterized in that
the wiring part (16) on the stamp (11) is fitted interchangeably.

10. The test apparatus as claimed in one of claims 2 to 9,
characterized in that
the holding part (14) on the wiring part (16) is fitted interchangeably.

11. The test apparatus as claimed in one of the preceding claims,
characterized in that
the locating seat (9) has a central opening (24) which corresponds to an optical sensor region (25) of the semiconductor device (2) and which is accessible from outside of the test apparatus (1).

12. The test apparatus as claimed in one of the preceding claims,
characterized in that
the opening (24) is an irradiation opening which allows the semiconductor device (2) to be irradiated.

13. A method for testing a semiconductor device (2) having contact pads (3) on its top (4) and its back (5), where the method has the following method steps:
- a test apparatus (1) as claimed in one of claims 1 to 1 is provided;
- the test apparatus (1) is equipped with a test socket (8) which has a locating seat (9) matching the semiconductor device (2) to be tested and with a stamp (11) which has a holding part (14) and a wiring part (16) which match the semiconductor device (2) to be tested;
- the test socket (8) of the test apparatus (1) is fitted with the semiconductor device (2) to be tested by putting the top (4) of the semiconductor device (2) onto the locating seat (9) of the test socket (8);
- the stamp (11) with the wiring part (16) and the holding part (14) is pressed onto the back (5) of the semiconductor device (2) to make contact with the contact pads (3), provided for a test, on the top (4) and the back (5) of the semiconductor device (2) using the through-contact elements (10, 12, 13) of the test apparatus (1) to make electrical connections to the test printed circuit board (6).